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SUMMARY OF TRADE AND TARIFF INFORMATION

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Prepared in Terms of the Tariff Schedules
of the United States

FIREWORKS

TSUS item 755.15

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UNITED STATES INTERNATIONAL TRADE COMMISSION

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U.S. INTERNATIONAL TRADE COMMISSION RELEASES A SUMMARY ON FIREWORKS AS ONE OF A SERIES OF SUMMARIES OF TRADE AND TARIFF INFORMATION

Information on U.S. imports, exports, and production and on world trade in fireworks became available today as the United States International Trade Commission released another report in its new, in-depth series of summaries of trade and tariff information initiated this year.

The summaries of trade and tariff information are designed to meet the needs of wide and varied interests, including the Congress, the courts, Government agencies, importers, domestic producers, research organizations, and many others. The summaries contain accurate descriptions, in terms of the tariff schedules, of the thousands of products imported into the United States, and information on their methods of production, world supplies, and importance in trade and in the U.S. economy. The summaries also include substantive analytical material with regard to the basic factors affecting trends in consumption, production, and trade, and factors bearing on the competitive position and economic health of domestic industries.

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This report is being distributed to various Government agencies, congressional committees, and interested members of the public. In addition, as a service to the public, the field offices of the Department of Commerce and selected public and university libraries in large cities will be supplied with copies for commercial and professional consultation. Please address all communications regarding this report to the Secretary, U.S. International Trade Commission, 701 E Street NW., Washington, D.C. 20436.

UNITED STATES INTERNATIONAL TRADE COMMISSION

**SUMMARY OF
TRADE AND TARIFF
INFORMATION**

*Prepared in Terms of the
Tariff Schedules of the United States*

Fireworks

TSUS item 755.15

USITC PUBLICATION 841

CONTROL NO. 7 - 9 - 2

October 1977

III

Tariff Schedules of the United States

Schedule 1 – Animal and Vegetable Products

Schedule 2 – Wood and Paper; Printed Matter

Schedule 3 – Textile Fibers and Textile Products

Schedule 4 – Chemicals and Related Products

Schedule 5 – Nonmetallic Minerals and Products

Schedule 6 – Metals and Metal Products

***Schedule 7 – Specified Products; Miscellaneous
and Nonenumerated Products***

Schedule 8 – Special Classification Provisions

FOREWORD

Each Summary of Trade and Tariff Information is part of a series published periodically by the United States International Trade Commission to provide information on conditions of competition between domestic and foreign products and to include data on trade and development of U.S. industries. This report represents one of many being published in the current series of summaries.

This series provides comprehensive coverage of product uses, manufacturing processes, and commercial practices, and provides analysis of the numerous factors affecting U.S. and world trade in each commodity area. The summaries are cast in terms of the eight schedules of the Tariff Schedules of the United States (TSUS).

The current series will consist of approximately 1,000 individual reports published in looseleaf form which will enable the Commission to issue update sheets as appropriate for individual summaries. The overall program will run several years, ultimately covering all items of the TSUS.

TABLE OF CONTENTS

	<u>Page</u>
Executive summary-----	ii
Description and uses:	
Class B special fireworks-----	1
Class C common fireworks-----	2
Manufacturing process:	
Sparklers-----	3
Roman candles, rockets, and cones-----	3
Display fireworks-----	4
Tariff treatment:	
U.S. tariff treatment-----	4
Foreign tariff treatment-----	5
Regulations affecting the fireworks industry:	
Federal regulations-----	6
State regulations-----	6
Domestic industry-----	6
U.S. producers' shipments-----	9
Domestic employment-----	10
Financial information-----	10
Foreign industry-----	11
Domestic market-----	12
Foreign markets-----	16
Foreign trade-----	16
International trade practices-----	17
Imports and import trends-----	18
Exports and export trends-----	22

Tables

1. Class C fireworks: Regulations affecting their use in individual states-----	7
2. Fireworks: U.S. producers' shipments, 1967-76-----	9
3. Fireworks: Producers' shipments, exports of domestic merchandise, imports for consumption, and apparent consumption, 1967-76-----	14
4. Fireworks: U.S. imports for consumption, by principal sources, 1967-76-----	19
5. Fireworks: Percentage distribution of U.S. imports, by principal sources, 1971-76-----	20
6. Fireworks: U.S. imports for consumption, duty collected, and ad valorem equivalent of imports, by principal sources, 1976-----	21

Executive Summary

There are two basic types of fireworks--display and consumer. Display fireworks are intended for use in public displays while consumer fireworks are intended for sale to the general public for individual use. Because of various Federal and State regulations restricting their manufacture and use, fireworks are items of commerce for which the full effect of consumer demand is not felt in consumption.

Domestic output, 75 percent of which is accounted for by four firms, consists largely of specialized, complex products for public display and individual use. Imports consist in large part of firecrackers, which are not produced domestically, various other consumer items of comparatively low quality, and certain types of good-quality display fireworks. U.S. exports are insignificant.

From 1967 to 1976, apparent U.S. consumption for fireworks rose by 28 percent, from 22.6 million pounds to 29 million pounds. During this period, however, U.S. production fell by 45 percent while imports jumped by 158 percent, thus doubling their share of the market.

Because fireworks production is highly labor intensive, a large part of foreign output is centered in a number of Far Eastern countries, the People's Republic of China being the largest.

Description and Uses

Fireworks are any of a variety of devices which produce visual or audible effects through combustion or explosion. They contain flammable, combustible, or sometimes explosive materials that burn and produce flames, smoke, light, or sound effects. The products discussed in this summary are those which, if imported, would enter under item 755.15 of the Tariff Schedules of the United States (TSUS). Since fireworks are principally used to celebrate festive events such as holidays, there is some seasonality in their production and consumption.

Fireworks, by reason of their being hazardous materials, are subject to regulation by the Department of Transportation regarding their shipment by carriers engaged in interstate and foreign commerce. For such purposes, special fireworks are Class B explosives 1/ and common fireworks are class C explosives. 2/

Class B special fireworks

Class B special fireworks encompass display, or aerial, fireworks, i.e., those containing large amounts of pyrotechnic composition. They are intended for use in licensed public displays and are ignited by trained pyrotechnicians.

The demand for class B special fireworks is price inelastic in that a significant rise or fall in prices will not lead to a proportionate decrease or increase in sales. These articles are purchased principally by the actual display concessionaire--the ultimate consumer--and are used in large displays for mass entertainment, in which the cost of the articles can be indirectly passed to the audience or absorbed by the show's sponsors. Since they are used as entertainment or to attract an audience, such fireworks must compete with other forms of entertainment or sales promotions such as sporting events or sales giveaway promotions. Class B special fireworks are a low-technology product for which the manufacturing process has changed little, either in the United States or abroad.

Aerial fireworks are made in the form of a shell which is fired by means of a mortarlike apparatus. When the device is ignited, black powder (formerly called gun powder) propels it into the air, where it explodes or "breaks," giving the desired effects. A single shell can be designed to break from 1 to 10 times, each causing a separate effect.

1/ 49 CFR 173.88(d). "Special fireworks are manufactured articles designed primarily for the purpose of producing visible or audible pyrotechnic effects by combustion or explosion. . . ."

2/ 49 CFR 173.100(r). "Common fireworks and fireworks devices suitable for use by the public and designed primarily to produce visible effects by combustion. . . ."

The sound is caused by the ignition of either flash or black powder, and the visual effects are made by the burning of various combinations of chemicals.

In an aerial display device, six colors are possible. Magnesium or aluminum burns white when ignited, sodium salts burn yellow, strontium nitrate or carbonate burns red (although the nitrate compound is preferred, since the color is more brilliant), barium nitrate or chlorate burns green, copper salts burn a blue green, and charcoal or iron burns orange. Blue is the most difficult color to produce, owing to the characteristics of complementary compounds while burning. Currently, ammonium perchlorate combined with copper salt is preferred for blue.

Display fireworks are commonly used by civic or fraternal organizations to celebrate festive events such as New Year's or Independence Day. They are used in large amounts by recreation and amusement (or theme) parks as a complement to the entertainment offered or as a grand finale at closing time. Display fireworks are also used to celebrate other occasions, such as the grand opening of a department store or mall, or other significant commercial events.

Class C common fireworks

Class C common fireworks are those intended for sale to the general public. They differ from display fireworks principally in that they are smaller, contain much less pyrotechnic material, and are designed to be presented to a much smaller audience, or used by an individual. Class C common fireworks are used primarily for celebration of significant events or holidays such as the Fourth of July or New Year's Day; they are also used for religious and other occasions such as births and weddings, and to scare away pests such as crop-destroying birds. Examples of this class are sparklers, firecrackers, roman candles, rockets, helicopters, fountains, and wheels.

Class C common fireworks are essentially price elastic in terms of demand in that a rise in price would result in a significant decline in sales; this elasticity becomes effective after some demand inelasticity due to necessary consumption for agricultural or religious use. Class C common fireworks enter the marketplace as finished goods, generally with individual households as the ultimate consumers. Firearms offer some substitutability for these items in warding off pests, and other forms of entertainment compete with fireworks when they are used for family amusement.

The Class C type of fireworks is set in motion by lighting a fuse (or, in some instances, the tip or edge of the device), which in turn ignites the pyrotechnic composition. Each type of device in this class reacts differently--some explode with a loud report, others produce a shower of colors as the components are ignited, while others are propelled into the air where they produce audible and visual effects.

Manufacturing process

Because of safety requirements, and in order to comply with Federal and State regulations dealing with fireworks manufacture and storage (both Classes B and C), a typical plant site contains many small processing buildings located 100 or more feet apart. To allow for some degree of efficiency, like operations occur relatively close to one another. Raw material storage, especially flammable materials and powder, is located far from the nearest operational line, sheltered by tree stands and land contours.

Finished Class C fireworks products and the raw materials used, if not tightly confined will not explode but will burn freely if accidentally ignited. Consequently, small processing buildings have an advantage over larger, more efficient facilities because of the safety factor; in the event of fire, smaller manufacturing plants can continue to operate with only the loss of a single stage of production.

Fireworks are low-technology items whose production processes have experienced little change over the years. The major types of fireworks produced in the United States are sparklers, roman candles, rockets, cones, and Class B type display fireworks. A description of the manufacturing processes follows.

Sparklers.--Although there may be some minor variation in the fabricating process employed by individual producers, the method of manufacturing sparklers used by them is essentially the same. The wire frames are first cut to the desired length and then dropped or shaken into large wooden trays which separate and hold in place 100 or more frames. The pyrotechnic composition is mixed from the raw materials which are obtained in bulk. Barium nitrate, aluminum powder, and crushed iron (the barium compound sometimes is imported from West Germany) are combined into a water soluble compound in large vats. Care in mixing the ingredients is required in order to produce the sparkle effect with little or no molten drippings when the product is used. The mixture is then transferred to dipping vats. The wire frames in the tray are then dipped into the vats of compound and placed on a conveyor-type hanger which passes through a heat chamber where the compound is dried. After sufficient drying time, the finished articles are transported to the packing operation where they are inspected and boxed to the buyer's specifications.

Roman candles, rockets, and cones.--Roman candles, rockets, and cones (fountains), while dissimilar in chemical composition, performance, and appearance, are manufactured by a basically similar process. The common raw materials in their processing are barium, potassium perchlorate and nitrate, sulphur, binders, aluminum, and charcoal. The following process applies directly to the production of roman candles but is also typical of the process used in the production of the other pyrotechnics in their class.

The hard paper cylinders for roman candles are purchased as a raw material. This paper body is sawed to the proper lengths, and one end is sealed. The required ingredients are mixed, and the mixture is inserted into the formed tubes and mechanically tamped. Pyrotechnics are added and changes made to achieve novel effects as required. The pyrotechnic core is wrapped with paper, and a fuse is inserted. A typical fuse is 2 inches long and is fabricated to burn at a rate of 3 seconds per inch. ^{1/} The fuses are plastic coated so as to eliminate accidental side ignition. After insertion of the fuse, the product is boxed, ready for transport and sale.

Display fireworks

Machine-made display fireworks are considered to be inferior to those made by hand. The bursting shell is the most elaborately constructed type of fireworks, requiring a rather high degree of technical skill to produce. In its manufacture, heavy weight paper is rolled around molds to form a basic case. A delicate handmade charge is inserted into the core and sealed, often by sawdust. A metal tube containing blasting powder is fitted into the shell's center to allow for an aerial explosion. Cubes of color-producing chemicals are then inserted and packed around the metal tube. Before being ready for use, the shell is wrapped with twine and then with paper.

Tariff Treatment

U.S. tariff treatment

Imported fireworks are provided for under TSUS item 755.15 with a rate of duty of 12 cents per pound, including the weight of all coverings, packing material, and wrappings. This rate applies to all imports, whether or not from countries with most-favored-nation (MFN) status, as there has not been a trade-agreement concession with respect to articles in this TSUS item.

Effective August 31, 1963, when the TSUS was implemented, all fireworks were consolidated under a single tariff provision (item 755.15), and the rate of duty was changed to 32 percent ad valorem. This ad valorem rate of duty represented the estimated weighted average of the three previous classifications. The TSUS also initially provided a column 2 rate of 42 percent ad valorem for imports from non-MFN countries. However, the Tariff Schedules Technical Amendments Act of 1965 (Public Law 89-241, approved Oct. 7, 1965) amended the

^{1/} The fuses used were designed through the cooperation of Federal safety and fireworks industry officials in an attempt to reduce user injuries due to accidental or premature ignition.

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rate of duty to its present level. The average ad valorem equivalent of the current rate of duty (12 cents per pound), based on imports entered in 1976, was 15 percent.

Fireworks are not subject to preferential duty-free tariff treatment under the U.S. Generalized System of Preferences.

Foreign tariff treatment

Fireworks are provided for under heading item 3605.20 of the Brussels Tariff Nomenclature (BTN) and under various item numbers for countries which do not use the BTN classification system. These articles are dutiable at various rates throughout the world.

The largest supplier of fireworks to the United States, the People's Republic of China, also has the highest corresponding import duties on fireworks. China has established tariffs of 100 percent ad valorem on fireworks in the "lowest rate" category, and 150 percent for imports under the "normal" rate category. The "lowest rate" category is comparable to the most-favored-nation, or column 1 rate in the TSUS; the "normal" rate corresponds to the column 2, or statutory, rate of duty. Imports into China are directly controlled through various foreign trade corporation monopolies. Contractual agreements are drawn up with duty rates unmentioned--these costs are included in the cost of the article by the purchasing authority. Since all trade is carried out through these monopolies, which are in turn funded by the central Government, trade is on an as-needed basis. Thus, levels of imports are not controlled by price but rather by the planning authority. For fireworks, therefore, duties are unimportant as a barrier to trade with China.

Taiwan, the second-largest supplier of fireworks to the United States, also has the second-highest rate of duty (52 percent ad valorem) among suppliers of imports of these articles. In addition to the duty, fees are levied on imported articles in the form of port taxes. For example, Taiwan charges an additional tax of 5 percent ad valorem as a port tax. This raises the effective duty rate by 7.6 percent, to 59.6 percent ad valorem.

Japan's Customs Tariff Schedules list fireworks as dutiable at a rate of 6 percent ad valorem. The European Economic Community, which uses the BTN classification system, has established a duty of 11.2 percent on these imports. Canada provides for fireworks under item 6650.01 of the Canadian Tariff Schedules at 20 percent ad valorem.

Virtually all countries have health and safety regulations covering fireworks sale and use. In order to be allowed for sale in these countries, samples are examined for composition mix and content and safeguards against accidental discharge. These regulations are equally applicable to fireworks whether imported or domestically produced.

Regulations Affecting the Fireworks Industry

Federal regulations

The hazardous nature of fireworks has caused the implementation of a number of regulations affecting their production and marketing. As indicated earlier, under regulations of the Department of Transportation, fireworks are separated into two categories--Class B special fireworks and Class C common fireworks. These regulations also set limits on the amounts and kinds of combustible or explosive compounds that may be used in fireworks. Fireworks are also within the jurisdiction of the Consumer Products Safety Commission (CPSC) and the Food and Drug Administration.

State regulations

Class B special fireworks are allowed in all 50 States, provided that the display is carried out by trained pyrotechnicians. However, all States, except New Mexico, require State and local permits to conduct a fireworks display.

As shown in the following table, 18 States do not allow the sale of Class C common fireworks. The remaining 32 States allow the sale of some or most Class C consumer fireworks within their boundaries. Of the 32 States, 10 allow the sale and use of all Class C fireworks if not specifically forbidden by county and city ordinances.

Domestic Industry

There are currently 59 firms engaged in the manufacture of fireworks in the United States. Four of these firms, operating six plants, account for 75 percent of total annual U.S. production. The tabulation on page 8 lists these major producers and the number and locations of their plants.

Class C fireworks: Regulations affecting their use in individual States

States	Type allowed	Legal retail selling period
Alaska-----	All Class C	: Year round
Arkansas-----	All Class C	: June 20-July 10; Dec. 10-Jan. 5
Louisiana-----	All Class C	: June 25-July 5; Dec. 15-Jan. 1
Mississippi-----	All Class C	: June 15-July 5; Dec. 5-Jan. 2
Missouri-----	All Class C	: June 20-July 10; Dec. 10-Jan. 5
Hawaii-----	All Class C not locally: : banned	: Year round
Nevada-----	All Class C not locally: : banned	: Specified periods
New Mexico-----	All Class C not locally: : banned	: Specified periods
South Dakota-----	All Class C	: June 27-July 5
Tennessee-----	All Class C	: June 20-July 5; Dec. 10-Jan. 5
Montana-----	Most Class C 1/	: June 24-July 5
North Dakota-----	Most Class C 1/	: June 27-July 5
Oklahoma-----	Most Class C 1/	: June 15-July 6; Dec. 15-Jan. 2
South Carolina-----	Most Class C 1/	: Year-round
Texas-----	Most Class C 1/	: June 25-July 4; Dec. 15-Jan. 1
California-----	Limited Class C 2/	: June 28-July 6
District of Columbia-----	Limited Class C 2/	: Year round
Idaho-----	Limited Class C 2/	: June 15-July 5
Kansas-----	Limited Class C 2/	: June 27-July 5
Kentucky-----	Limited Class C 2/	: Year round
Nebraska-----	Limited Class C 2/	: June 25-July 4
Virginia-----	Limited Class C 2/	: Year round
Washington-----	Limited Class C 2/	: June 28-July 6
Wyoming-----	Limited Class C 2/	: Year round
Alabama-----	Sparklers	: June 25-July 5; Dec. 15-Jan. 1
Colorado-----	Sparklers	: Year round
Florida-----	Sparklers	: Year round
Indiana-----	Sparklers, snakes	: Year round
Iowa-----	Sparklers, snakes	: Year round
Michigan-----	Sparklers, snakes	: Year round
Oregon-----	Sparklers, snakes	: Year round
Utah-----	Sparklers	: Year round
Wisconsin-----	Sparklers, snakes	: Year round
Arizona-----	None	: -
Connecticut-----	None	: -
Delaware-----	None	: -
Georgia-----	None	: -
Illinois-----	None	: -
Maine-----	None	: -
Maryland-----	None	: -
Massachusetts-----	None	: -
Minnesota-----	None	: -
New Hampshire-----	None	: -
New Jersey-----	None	: -
New York-----	None	: -
North Carolina-----	None	: -
Ohio-----	None	: -
Pennsylvania-----	None	: -
Rhode Island-----	None	: -
Vermont-----	None	: -
West Virginia-----	None	: -

1/ Prohibits sky rockets and roman candles, but may permit some types of firecrackers.

2/ Generally excludes firecrackers, roman candles, rockets; sets limits on the amount of pyrotechnics used in permitted devices.

Source: Fireworks Buyers Guide, 1974.

<u>Producer</u>	<u>Number of plants</u>	<u>Location</u>
New Jersey Fireworks, Inc-----	2	Elkton, Md., and Vineland, N.J.
Keystone Fireworks, Inc-----	2	Elkton, Md., and Dunbar, Pa.
United Fireworks, Inc-----	1	Dayton, Ohio
Tri-State Fireworks, Inc-----	1	Loveland, Ohio

These firms produce a full line of fireworks and restrict their output to only those products.

The remaining 55 firms, which account for the balance of domestic output (25 percent), are located throughout the United States, particularly in California, Texas, New Mexico, Illinois, Maryland, and Massachusetts. These firms restrict their output to particular types of fireworks, usually sparklers and certain display fireworks such as rockets and shells. Some of them supplement their product lines with imports of fireworks.

All domestic firms obtain their principal raw material from outside sources; the pyrotechnic ingredients are purchased from both domestic and foreign sources, while wire and paper tubes are all domestic in origin.

Except for changes required in the interest of employee safety or mandated by Federal or State law, the typical large producers have initiated little technological change in their manufacturing processes. Machinery replacement is made on an as-needed basis, usually with new machinery adapted by the firm to meet its specific needs. For a number of reasons, projected capital expenditures for new fireworks manufacturing equipment are low. Even with present facilities, none of the larger firms are producing at full capacity; there appears to be general agreement among them that large capital expenditures to automate production are generally not economically feasible because of the nature of their product and the low level of technology required. Moreover, a large firm will typically produce over 100 different types of fireworks, each requiring a degree of adaptation not easily found in a mechanical operation. Thus, specialized equipment to handle similar types of article is considered price-prohibitive in view of unknown future demand for these articles. In addition, anticipated actions by the regulatory agencies--specifically the possibility that the CPSC might impose a total ban on Class C common fireworks--have caused firms to reconsider large-scale capital outlays for expansion and increased efficiency.

On the other hand, smaller firms within the industry are incorporating new technology in an attempt to increase efficiency and productivity. The smaller firm is able to incorporate this technological

change owing to specialization. For example, one firm producing only sparklers has undertaken a relatively large capital expenditure to improve its packaging process. This process increases boxing speed by approximately three times, and at the same time requires fewer workers. This firm contemplates further technological expenditures, but they are now held in abeyance until the impact of current improvements on profitability is gauged.

U.S. producers' shipments

As shown in the table below, U.S. producers' shipments of fireworks dropped irregularly from an estimated 14.6 million pounds, valued at \$9.6 million, in 1967, to 8.1 million pounds, valued at \$7.3 million, in 1976--amounting to a decline of 45 percent in terms of quantity and 24 percent in terms of value. Reflecting rising production costs and inflation, average annual unit values increased over the period from \$0.66 per pound in each of the years 1967-69 to \$0.90 per pound in 1976. Class C fireworks--particularly roman candles, rockets, fountains, and sparklers--accounted for approximately 90 percent of annual shipments. Of the Class B fireworks (10 percent of shipments), shells were the most important product produced.

Fireworks: U.S. producers' shipments, 1967-76

Year	: Quantity:	: Value	: Average unit value
	: <u>1,000</u> : <u>1,000</u> : <u>Per</u>		
	: <u>pounds</u> : <u>dollars</u> : <u>pound</u>		
1967-----	: 14,600 :	: 9,640 :	: \$0.66
1968-----	: 13,700 :	: 9,000 :	: .66
1969-----	: 13,700 :	: 9,100 :	: .66
1970-----	: 12,500 :	: 9,100 :	: .73
1971-----	: 12,300 :	: 9,500 :	: .77
1972-----	: 12,700 :	: 10,000 :	: .79
1973-----	: 12,100 :	: 9,900 :	: .82
1974-----	: 7,000 :	: 5,700 :	: .81
1975-----	: 7,400 :	: 6,000 :	: .81
1976-----	: 8,100 :	: 7,300 :	: .90
	: :	: :	: :

Source: Estimated from data supplied to the U.S. International Trade Commission by domestic producers.

The decrease in total shipments which occurred during 1967-76 is attributable largely to Federal, State, and local regulations which

required refinements in safety and content of the articles produced. Also, U.S. firms have increasingly gone to the manufacture of the more sophisticated types of fireworks in order to maintain a share of the market. The manufacturing process of these more complex products requires a larger proportion of intricate hand labor, thus tending to reduce total poundage outputs.

Domestic employment

Average total employment of production and related workers in the domestic fireworks industry reached its highest level in 1967 when it totaled about 2,000 workers. Thereafter, reflecting declining production, such employment dropped to a low of approximately 700 workers in 1974, a particularly bad year because of the possibility of a total ban on the use of fireworks. On the other hand, 1975 was characterized as a rebuilding year, and employment increased slightly to about 800 workers when the proposed ban did not materialize. In 1976, employment rose still further to about 1,000 workers.

Labor is the major cost element in the production of fireworks. Labor input in the domestic industry is supplied mainly by semiskilled workers. Training may require from a minimum of 2 weeks to as much as 5 months, depending upon the nature of specific duties assigned. The average age of employees within the industry is in the mid-50's. Workers are generally employed full-time; in periods of peak production, however, part-time labor is occasionally utilized. Wages are generally based on an hourly rate, sometimes with a quota incentive bonus. The actual assembly of fireworks is usually accomplished by women workers because it is felt that they are generally more dexterous than their male counterparts. Male workers are often used as laborers and in positions where more hazardous machinery is utilized. The average wage rate for production and related workers in 1976 was about \$2.80 per hour. Wage rate increases have resulted mainly from minimum wage requirements and cost of living escalators. A 40-hour week is standard in the industry, but substantial overtime is usually necessary in the peak shipping period, mid-March through May.

Financial information

Since the fireworks industry is relatively small, and most producing firms are closely held, little detailed financial data are available. Domestic firms have reported wide-ranging profit-and-loss information for recent years. The ratio of average net profit to sales was reported to be 5 percent within the industry for 1976. Although manufacturers report that a profit-to-sales ratio of 15 percent is required to recoup the opportunity cost of capital investment, they state that a 15 percent ratio was last realized in the industry during the early 1960's.

Working capital for the domestic industry is generally obtained through undistributed earnings; in some cases, short-term bank loans are secured during periods of revenue shortfall. These periods generally occur at the time when firms are beginning to gear up for maximum output before the peak season. Capital infusions by the owners can also occur during these periods. Because of the low profit ratios in the fireworks industry, banks are sometimes hesitant to lend financial assistance directly to a firm. Thus, owners are often required to obtain signature loans in their own names in order to obtain necessary financing.

Foreign Industry

As might be expected because of its labor-intensiveness, fireworks production is centered principally in developing countries with low wage rates. The bulk of such items are produced in the Far East, principally, Macao, the People's Republic of China (China), the Republic of China (Taiwan), Hong Kong, and Japan. Firecrackers are the principal type of fireworks produced by most foreign countries. The method of manufacture for these items has changed little over the last two decades.

The first process in the making of firecrackers in foreign countries, that of rolling the small paper casings and coverings, is performed primarily by women and children. This operation often occurs in the workers' own households, using a simple wooden apparatus owned by the workers themselves. The work, while tedious, is done with relative ease, and it is possible to form more than 3,000 casings per worker per day.

The paper used for the fuse may be of different materials, but the most common is rice paper stiffened with paste. The fuse paper is usually about one-third of an inch wide and several inches long. It is laid on a table, and a small amount of powder is sifted down the middle. The fuses are twisted before insertion into the firecrackers. The required number of firecrackers are then strung together, wrapped, and labeled.

Other types of fireworks are generally manufactured by the same methods used in the United States; some exceptions occur because of differences in raw materials and because of the type of article produced, especially display fireworks. Each manufacturing country tends to specialize in certain characteristic types of fireworks displays.

The weight of the raw materials used in the manufacture of display fireworks is a significant consideration for two reasons. First, the weight is important because of its effect on transportation costs for the finished good, and second, the weight of component

parts becomes a significant factor when the item is exported to a country which has a tariff rate based on weight (as is the case in the United States). ^{1/}

In the production of Class B fireworks, U.S. pyrotechnicians tend toward multiple-break shells that give birth to one effect after another. The French are famous for color precision. Oriental shells feature a quick radial burst of stars, often compared to the spread of flowers like chrysanthemums. Italian fireworks tend to noise-emitting effects.

Specialization occurs even in Class C consumer fireworks. The West German pyrotechnicians, for example, have developed rockets which rise, burst, and release confetti or streamers. This effect is commonly used in West Germany as a means to draw attention to new shops or shopping centers. German fireworks often employ parachutes, a technique which allows for effects of longer duration.

Fireworks manufactured abroad closely resemble domestic merchandise in both appearance and function. In the past it was a common practice of U.S. importers to send many domestic items to the Orient for examination; it was then determined whether such items could be produced overseas and shipped to U.S. markets at competitive prices.

For some years, the vast majority of pyrotechnic articles imported into the United States were small firecrackers. Since these items were not and are not manufactured domestically in any significant quantity, the imported firecrackers complemented domestic production rather than competed with it. Since 1970, however, there has been a trend by U.S. importers toward importing a full line of fireworks, including such items that were traditionally domestically produced.

The competitive advantage of these imports occurs in large part because of low labor costs in a labor-intensive industry; this lower cost may permit the foreign manufacturer additional profit, may pass on through the market channels to consumers, or may permit a higher profit margin for retailers.

Domestic Market

The U.S. market for fireworks has fluctuated from year to year during the past decade. The table on page 14 shows that estimated apparent consumption in 1967 was 22.6 million pounds, valued at \$13.3 million.

^{1/} For example, sparklers of equal length, one a product of India, the other U.S.-produced, are boxed in similar containers with an equal number in each container. However, the Indian product has both a thinner wire frame and less pyrotechnic composition. Thus, the impact of weight as an element of cost in shipping and import duties is evident.

Consumption held relatively steady in 1968, but dropped slightly in weight to 22.3 million pounds in 1969; at the same time, however, the value of consumption rose by 5 percent, to \$14 million. Consumption picked up slightly in 1970 and 1971, and increased in 1972 by 20 percent over 1971, to 29.4 million pounds, valued at \$18.7 million. This trend continued into 1973 when consumption increased further by 16 percent to its highest level--over 34 million pounds, valued at \$21.5 million. In 1974, however, owing to the action of the CPSC with regard to a fireworks ban, as was discussed in the section on regulation, consumption dropped by 59 percent, to 13.9 million pounds, valued at \$11.6 million. The market improved by 44 percent in 1975 and by an additional 45 percent in 1976, when consumption amounted to 29 million pounds, valued at \$22 million. However, consumption in the bicentennial year of 1976 still trailed the peak year, 1973, by 15 percent, in terms of quantity.

During this period, the quantity of imports as a share of consumption in terms of weight increased without interruption from 36 percent in 1967 to 65 percent in 1973. Following the downward slide in consumption in 1974, imports fell to 50 percent. Since 1974, however, imports have trended upward in relation to the market, reaching 63 percent in 1975, and finally 72 percent in 1976--an historical high.

The channels of distribution of Class C common fireworks are complex. Most manufacturers and importers of these articles conduct their business operations through regional distributors. These distributors receive and warehouse incoming shipments, with most of their activities occurring about 6 weeks before periods of peak demand. The distributors sell to independent jobbers who handle the intermediate marketing tasks. Jobbers generally accept shipments on a consignment basis and in turn distribute the product to the individual retailer or retail chain no later than 1 month before peak selling periods. Jobbers and distributors may also be retailing operations, leasing roadside stands or other low-cost locations for the 4 to 6 weeks before the season. These subsidiary locations are generally operated by independent managers who receive a fixed percentage of the location's profit, after deduction for overhead.

Markups and profit margins by the individual elements in the chain of distribution are varied, but they are usually higher for Class C common fireworks than for Class B special fireworks. The short selling period (usually 10 to 20 days, depending upon State regulations) is cited as the main reason for high markups in each link of the chain. A 250-percent markup of domestic merchandise is not uncommon; foreign fireworks may have markups of 400 percent or more by the time the goods reach the ultimate consumer.

Display-type fireworks generally carry much lower profit margins, mainly because there are fewer middlemen involved in their sale. Moreover, since larger volume sales are involved, competition is more intense. Domestic producers sometimes operate the displays

Fireworks: Producers' shipments, exports of domestic merchandise, imports for consumption, and apparent consumption, 1967-76

(Quantity in thousands of pounds; value in thousands of dollars)

Year	Pro- ducers' ship- ments 1/	Exports 2/	Imports	Apparent consump- tion	Ratio (percent) of imports to consumption
Quantity					
1967-----	14,600	145	8,135	22,590	36
1968-----	13,700	130	9,033	22,603	40
1969-----	13,700	130	9,721	22,291	44
1970-----	12,500	120	12,194	24,574	50
1971-----	12,300	120	12,343	24,523	50
1972-----	12,700	130	16,793	29,363	57
1973-----	12,100	120	22,130	34,110	65
1974-----	7,000	40	6,979	13,939	50
1975-----	7,400	40	12,636	19,996	63
1976-----	8,100	50	20,992	29,042	72
Value					
1967-----	9,640	90	3,714	13,264	28
1968-----	9,000	90	4,387	13,297	33
1969-----	9,100	85	4,983	13,998	36
1970-----	9,100	85	7,101	16,116	44
1971-----	9,500	90	7,509	16,919	44
1972-----	10,000	100	8,798	18,698	47
1973-----	9,900	95	11,692	21,497	54
1974-----	5,700	30	5,916	11,586	51
1975-----	6,000	30	9,887	15,857	62
1976-----	7,300	45	14,670	21,925	67

1/ Estimated from data supplied to the U.S. International Trade Commission by certain domestic producers.

2/ U.S. exports of fireworks are not separately provided for in export statistics; however, fireworks are estimated to be less than 1 percent of total U.S. production.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

themselves, importing shells directly or through agents from abroad to add to the variety of the show. At other times, major display producers will purchase the whole show directly from several manufacturers; these major show producers may act as buyers for several smaller producers in order to obtain the most favorable bulk price. Producers report that profit margins for this type of fireworks rarely exceed 50 percent.

As with most products, supply and demand ultimately influence the pricing of fireworks in the marketplace. Domestic articles must remain roughly price-competitive with imports at the sales counter for a variety of reasons. The retailer, faced with stocking two types of articles for short selling periods will usually opt for the type which allows for the greatest profit; therefore, U.S. fireworks manufacturers are forced to hold down prices as much as possible to permit an adequate profit margin at retail. While there is some brand and quality identification, consumers generally look for lower prices as a purchasing consideration. Since there is uncertainty as to further restrictions on the sale and use of these articles, competitiveness allows for some measure of future market control in items which may be unrestricted.

Discounts in the purchase of fireworks at the wholesale level take several forms. U.S. manufacturers generally give the standard 2 percent discount for payment in 10 days; most domestic business is carried out in this manner. The U.S. producers also allow for extended credit for larger purchases; some wholesalers currently withhold complete payment in an attempt to obtain an allowance for unsold or defective merchandise after the selling season. This allowance is given by manufacturers as a goodwill measure, and insures reorders from wholesalers who might otherwise import their total fireworks requirements.

Transportation costs are an important consideration in the pricing and marketing of fireworks. Restrictions on the shipment of these items by mail require the use of trucking, rather than other, perhaps less expensive modes of transport. Transport costs, while borne directly by the buyer, are prepaid. The goods are invoiced f.o.b. the manufacturer, and a percentage allocation based on the size of the order is added as the cost of shipment. While these costs are not a determining factor, they are nevertheless a factor of demand in that they increase the cost to consumers.

Price increases on domestic merchandise have been evident largely at the retail level. According to industry sources, recent U.S. manufacturing costs, while increasing with increased wages and costs of raw materials, have not been totally reflected in wholesale prices owing to competitive pressures from imported fireworks.

Because of the prohibition of shipments by mail, it is common practice in the industry for manufacturers to share trucking capacities

for shipments to the same distribution regions. Such shipments may be sent three times per week during periods of slack demand. However, for the peak demand periods it is not unusual for a single large manufacturer to dispatch several fully loaded trucks per day to its peak market areas.

Foreign Markets

Demand for fireworks worldwide is estimated to be increasing as rates of population increase, with the principal markets located in the Far East and Europe. While no statistics on total foreign consumption are available, the People's Republic of China is considered the major world consumer of these articles; fireworks are used there for celebrations, religious and nonreligious. Fireworks, primarily firecrackers are typically used to celebrate occasions such as births, deaths, weddings, and Chinese New Year. Displays are conducted frequently as a means of entertainment in China.

The demand for fireworks in the Far East, the area of highest consumption, is supplied almost exclusively by local manufacturing operations. These concerns may sell directly to the consumer, operate through wholesalers, or sell to retail concerns. The main item of commerce in these countries (firecrackers) is not produced in any significant quantity in the United States.

In Europe, the other principal fireworks market, there is a constant demand for Class C and Class B display fireworks from other countries. Principally used to complement local types of fireworks in displays, the demand for these items is accounted for by fireworks show producers, who import needed stocks directly from overseas suppliers.

Foreign Trade

To the domestic producer, the international commerce in fireworks plays no large part in production planning; less than 1 percent of total U.S. production is destined for export. And the bulk of this exportation is carried out by the four major producers only.

Foreign firms, on the other hand, look to the U.S. market as a potential consumer of ever-increasing amounts of their production. In 1967, U.S. imports accounted for about 36 percent of total apparent domestic consumption of fireworks in terms of weight. Imports in 1976 accounted for over 70 percent of consumption, and this trend is projected to continue. To foreign producers faced with excess capacities, especially in Far Eastern plants, the United States offers a market for their products. Because wage rates are comparatively low (about \$0.50 per hour compared with \$2.80 in the United States in 1976) the low-cost items produced abroad often enjoy a price advantage over domestic articles.

Fireworks were one of the first types of articles imported directly from the People's Republic of China after trade relations were established in 1972. The People's Republic has gone on to become the major foreign supplier of these items to the U.S. market rising from 1 percent of total imports in 1971 to 62 percent in 1976.

No multinational firms are believed to be engaged in fireworks production or distribution.

International Trade Practices

The importation of fireworks into the United States is carried out in several ways and by a variety of groups. Domestic manufacturers, large wholesalers, import marketing firms, and producers of individual fireworks shows all import to some degree.

Domestic manufacturers import certain items to supplement product lines with articles unsuited for domestic production; advantageous labor rates in the Far East allow for lower unit costs in some types of fireworks, especially firecrackers, and are cited frequently as a determinant for importation rather than production. The importation itself can occur in several forms. Many new firms abroad, particularly in Taiwan, India, and Brazil, make use of U.S. agents to facilitate the contacts in this market. As a firm becomes more established, however, more marketing functions are assumed by the firm until the agent is virtually eliminated. Dealings with a consortium of foreign manufacturers is not uncommon. For example, a group of five Indian sparkler producers (Anil, Cock, Eagle, Royal, and Original Fireworks) deal as a body named "The Standard Fireworks Industries." This body shares capacities and orders and the resulting costs involved in sales.

Wholesalers and direct importers may operate independently or together. Again, dealings may go through a domestic agent or be made directly with the foreign manufacturer. These wholesalers and importers account for the bulk of Class C fireworks entering the U.S. market.

Individual display show producers also import a significant amount of Class B fireworks. Production companies--such as Walt Disney Co., Inc., one of the largest display exhibitors in the United States--purchase supplies needed for their fireworks exhibitions directly from manufacturers throughout the world. At times the purchaser will make all arrangements for sale, even to the point of stipulating types of materials used in exclusive items which may then bear the purchaser's name.

The People's Republic of China requires all foreign transactions to be carried out by state trading monopolies. In this instance, the importer deals directly with an arm of the central Government, which dictates terms of sale. Exposure to this manufacturing market is generally limited to annual fairs conducted in China for the benefit of foreign businesses. Purchases are either made during the presentation or through contacts established during the trade fair.

Payment for all imported fireworks is generally accomplished through bank transfers; however, irrevocable letter of credit are sometimes used, especially for initial purchases. Open accounts or other extensions of credit are rarely used. Consignment sales at the international level are rare, if not nonexistent.

Prices are quoted including c.i.f. (cost, insurance, and freight) at designated ports, usually on the west coast. The primary mode of transport to the United States is ocean freight, with no specific flag carriers required.

Imports and Import Trends

U.S. imports of fireworks, as shown in the following table, amounted to 8.1 million pounds, valued at \$3.7 million in 1967, and increased annually thereafter until 1973, when they reached their highest level--22.1 million pounds, valued at \$11.7 million. In 1974, however, imports fell by 68 percent, to 7 million pounds, valued at \$5.9 million. This decline is attributable to actions taken by the CPSC in 1973 and 1974. In September 1973, the CPSC assumed responsibility for administration of the Federal Hazardous Substances Act (15 U.S.C. 1261) and in May 1974 issued an order, to become effective the following month, that would have banned firecrackers, the major items of importation. Importers were unwilling to build inventories of nonsalable goods, and although the ban did not eventuate, the fear of such a ban held imports far below 1973 levels until 1976 when 21 million pounds, valued at \$14.7 million, entered the United States.

During the period 1967-73, the leading suppliers of fireworks were Taiwan, Macao, and Japan. However, imports from China, which began in 1971, accounted for 33 percent of total imports by 1973, second only to Taiwan.

China, having overtaken Taiwan in 1975, led all import sources with 13 million pounds, or 62 percent of all imports in 1976. This position of dominance was reached in only 6 years. From 1971 to 1976, imports from China jumped by 7,529 percent, at a time when imports from the four other major suppliers (Taiwan, Macao, Japan, and Hong, Kong) dropped by 38 percent.

Fireworks: U.S. imports for consumption, by principal sources, 1967-76

Source	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Quantity (1,000 pounds)										
China-----	0	0	0	0	171	1,386	7,361	1,319	6,883	13,045
Taiwan-----	250	600	1,343	3,010	3,991	6,453	7,584	2,569	2,557	3,788
Macao-----	4,972	4,875	4,991	6,176	5,257	5,365	3,695	708	922	1,435
Japan-----	2,146	2,382	2,330	2,040	1,908	1,688	1,074	842	587	653
Hong Kong-----	718	1,053	1,000	859	687	1,451	1,827	454	866	1,322
Brazil-----	0	0	0	0	1	118	96	241	425	235
United Kingdom-----	49	84	47	85	68	79	57	54	42	140
Canada-----	0	15	0	1/	80	85	43	125	86	47
All other-----	0	24	10	24	180	168	393	67	268	327
Total-----	8,135	9,033	9,721	12,194	12,343	16,793	22,130	6,979	12,636	20,992
Value (1,000 dollars)										
China-----	-	-	-	-	69	481	3,187	967	3,533	6,565
Taiwan-----	142	355	670	1,470	1,903	2,868	3,640	1,857	1,879	2,880
Macao-----	2,087	2,150	2,202	3,559	3,351	3,039	2,410	645	957	1,620
Japan-----	1,147	1,360	1,525	1,428	1,371	1,283	1,130	1,368	1,392	1,351
Hong Kong-----	314	456	523	513	448	735	872	315	694	760
Brazil-----	-	-	-	-	1	60	49	359	569	386
United Kingdom-----	24	44	50	101	98	89	64	75	117	198
Canada-----	-	6	-	1/	118	84	68	262	199	130
All other-----	-	16	13	30	150	159	272	68	547	780
Total-----	3,714	4,387	4,983	7,101	7,509	8,798	11,692	5,916	9,887	14,670
Unit value										
China-----	-	-	-	-	\$0.40	\$0.35	\$0.43	\$0.50	\$0.51	\$0.50
Taiwan-----	\$0.57	\$0.59	\$0.50	\$0.49	.48	.44	.48	.72	.72	.76
Macao-----	.42	.44	.44	.58	.64	.57	.65	.91	1.04	1.13
Japan-----	.53	.57	.65	.70	.72	.76	1.05	.16	2.37	2.07
Hong Kong-----	.44	.43	.52	.60	.65	.51	.48	.69	.80	.57
Brazil-----	-	-	-	-	1.00	.51	.51	1.49	1.34	1.64
United Kingdom-----	.49	.52	1.06	1.19	1.44	1.13	1.12	1.39	2.79	1.41
Canada-----	-	.40	-	1/	1.48	.99	1.58	2.10	2.31	2.77
All other-----	-	.67	1.30	1.25	.83	.95	.69	1.01	2.04	2.39
Average-----	.46	.49	.51	.58	.61	.52	.53	.85	.78	.70

1/ Less than 0.5 percent.

Source: Compiled from official statistics of the U.S. Department of Commerce.

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The table below shows the percentage increase or decrease of imports from principal sources during 1971-76. Imports from Taiwan, Macao, and Japan, which combined to account for 90 percent of all U.S. imports of fireworks in 1971, declined annually thereafter until 1976, when they accounted for 28 percent of the total. Imports from China, however, rose dramatically over the period, increasing from only 1 percent in 1971 to 62 percent in 1976.

Fireworks: Percentage distribution of U.S. imports, by principal source, 1971-76

Source	Percent of total quantity imported in--						Percentage of increase or (decrease), 1976 from 1971
	1971	1972	1973	1974	1975	1976	
China-----	1	8	33	27	54	62	7,529
Taiwan-----	32	38	34	37	20	18	(5)
Macao-----	43	32	17	10	7	7	(73)
Hong Kong--	6	9	8	7	8	6	(9)
Japan-----	15	10	5	12	5	3	(66)
Brazil-----	-	1	1	3	3	1	-
United Kingdom--	1	<u>1/</u>	<u>1/</u>	1	<u>1/</u>	1	(2)
Canada-----	1	1	<u>1/</u>	2	1	<u>1/</u>	(41)
All other--	1	1	2	1	2	2	81
Total--	100	100	100	100	100	100	151

1/ Less than 0.5 percent.

Source: Compiled from official statistics of the U.S. Department of Commerce.

As was stated in the section on tariff treatment, the U.S. rate of duty on imported fireworks is 12 cents per pound, including the weight of all coverings, packing material, and wrappings. By converting this specific duty to an average ad valorem equivalent rate (AVE) it is possible to describe to some extent the nature of imports from individual countries. France, for example, had an AVE of 2.4 percent in 1976, thus indicating that imports from that country consisted of a high proportion of the more expensive, Class B display fireworks. Conversely, China and Hong Kong had significantly higher AVE's 23.8 percent and 20.9 percent, respectively, indicating that imports from those countries were composed mainly of the less expensive fireworks, principally firecrackers (see the following table).

Fireworks: U.S. imports for consumption, duty collected, and ad valorem equivalent of imports, by principal sources, 1976

Source	: Quantity	: Value	: Duty	: ad valorem
	: Pounds		: collected	: equivalent
				: Percent
China-----	13,045,234	\$6,565,282	\$1,565,423	23.8
Taiwan-----	3,787,717	2,880,082	454,382	15.8
Macao-----	1,434,689	1,620,205	172,162	10.6
Japan-----	652,528	1,350,685	78,304	5.8
Hong Kong-----	1,321,841	760,369	158,620	20.9
France-----	96,814	475,165	11,618	2.4
Brazil-----	235,480	385,817	28,258	7.3
United Kingdom-----	139,758	198,471	16,771	8.5
Canada-----	47,485	130,367	5,697	4.4
Republic of Korea-----	95,462	116,892	11,456	9.8
West Germany-----	28,259	80,033	3,393	4.2
Spain-----	28,900	41,841	3,468	8.3
Italy-----	10,439	34,920	1,253	3.6
Republic of	:	:	:	:
Philippines-----	17,840	15,820	2,141	13.5
India-----	48,391	11,990	5,807	48.4
Guatemala-----	760	2,160	91	4.2
Netherlands-----	61	374	7	1.9
Total-----	20,991,658	14,670,473	2,518,851	17.2
	:	:	:	:

Source: Compiled from official statistics of the U.S. Department of Commerce.

Exports and Export Trends

U.S. exports of fireworks are not separately reported in the official statistics of the United States; fireworks are included in a classification which also covers flares and other chemical signals. However, industry sources indicate that fireworks exports paralleled the trend of domestic production. Exports declined steadily during the period 1967-76, decreasing sharply from an annual average of 126,000 pounds in 1967-73, to a yearly average of only 43,000 pounds during 1974-76. Exports, which, in recent years, accounted for less than 1 percent of producers' output, are shipped principally to markets in Europe, the Orient, and South America.

Foreign purchasers obtain U.S.-produced fireworks principally to complement their own stocks; display producers abroad seek to obtain a variety of Class C and Class B fireworks from several countries, including the United States, to complement the types of fireworks produced locally.

SUMMARIES OF TRADE AND TARIFF INFORMATION

USITC Publication

Complete list of Summaries published to date in Schedule 7

Control No.	Title	Control No.	Title
7 - 1 - 1	Luggage		